

WHAT IS CLAIMED IS:

1. A method of introducing a nucleic acid into an adipocyte, the method comprising:
 - (a) contacting an adipocyte having a cell membrane with a nucleic acid molecule, thereby forming a mixture; and
 - (b) electroporating the mixture under conditions such that the cell membrane becomes permeablized;
such that the nucleic acid is introduced into the adipocyte.
2. The method of claim 1, wherein the nucleic acid molecule is an siRNA.
3. The method of claim 1, wherein the electroporation is carried out at between about 0.05 kV and about 0.5 kV, and at between about 750 μ F and about 1150 μ F capacitance.
4. The method of claim 1, wherein the electroporation is carried out at between about 0.1 kV and about 0.25 kV, and at between about 850 μ F and about 1050 μ F capacitance.
5. The method of claim 1, wherein the electroporation is carried out at 0.18 kV and 960 μ F capacitance.
6. The method of claim 1, wherein the electroporation is carried out at room temperature.
7. The method of claim 2, wherein the siRNA is targeted to an Akt1 or Akt2 nucleic acid sequence.
8. The method of claim 2, wherein the siRNA is targeted to a CISK nucleic acid sequence.
9. The method of claim 2, wherein the siRNA is targeted to a Myo1c nucleic acid sequence.

10. A method of inhibiting Akt1 expression or activity in a cell, the method comprising
 - (a) introducing into a cell expressing Akt1 an siRNA that targets an Akt1 sequence of SEQ ID NO:5 or SEQ ID NO: 6;
 - (b) culturing the cell under conditions such that the siRNA mediates RNAi;thereby inhibiting Akt1 expression or activity in the cell.
11. The method of claim 10, wherein the cell is an adipocyte.
12. A method of inhibiting Akt1 expression or activity in an adipocyte, the method comprising:
 - (a) introducing into an adipocyte expressing Akt1 an siRNA that targets an Akt1 sequence of SEQ ID NO:5 or SEQ ID NO: 6, wherein the siRNA is introduced according to the method of claim 1;
 - (b) culturing the adipocyte under conditions such that the siRNA mediates RNAi;thereby inhibiting Akt1 expression or activity in the cell.
13. A method of inhibiting Akt2 expression or activity into a cell, the method comprising
 - (a) introducing into a cell expressing Akt2 an siRNA that targets an Akt2 sequence of SEQ ID NO:7 or SEQ ID NO: 8;
 - (b) culturing the cell under conditions such that the siRNA mediates RNAi;thereby inhibiting Akt2 expression or activity in the cell.
14. The method of claim 13, wherein the cell is an adipocyte.
15. A method of inhibiting Akt2 expression or activity in an adipocyte, the method comprising:
 - (a) introducing into an adipocyte expressing Akt2 an siRNA that targets an Akt2 sequence of SEQ ID NO:7 or SEQ ID NO: 8, wherein the siRNA is introduced according to the method of claim 1;
 - (b) culturing the adipocyte under conditions such that the siRNA mediates RNAi;thereby inhibiting Akt2 expression or activity in the cell.
16. A method of inhibiting Myo1c expression or activity into a cell, the method comprising

- (a) introducing into a cell expressing Myo1c an siRNA that targets an Myo1c sequence of SEQ ID NO:14 or SEQ ID NO: 15;
- (b) culturing the cell under conditions such that the siRNA mediates RNAi; thereby inhibiting Myo1c expression or activity in the cell.

17. The method of claim 13, wherein the cell is an adipocyte.

18. A method of inhibiting Myo1c expression or activity in an adipocyte, the method comprising:

- (a) introducing into an adipocyte expressing Myo1c an siRNA that targets an Myo1c sequence of SEQ ID NO:14 or SEQ ID NO: 15, wherein the siRNA is introduced according to the method of claim 1;
- (b) culturing the adipocyte under conditions such that the siRNA mediates RNAi; thereby inhibiting Myo1c expression or activity in the cell.

19. A method of inhibiting insulin-mediated GSK3 α phosphorylation, the method comprising contacting an insulin-sensitive cell with an agent that inhibits Akt2 expression or activity, such that insulin-mediated GSK3 α phosphorylation is inhibited.

20. The method of claim 19, wherein the agent is an siRNA targeted to Akt2.

21. The method of claim 20, wherein the siRNA targets an Akt2 sequence of SEQ ID NO: 7 or SEQ ID NO: 8.

22. A method of inhibiting hexose transport, the method comprising contacting a cell that can conduct hexose transport with an agent that specifically inhibits expression or activity of Akt1, Akt2, or both, such that hexose transport is inhibited.

23. The method of claim 22, wherein the agent specifically inhibits expression or activity of Akt1 or Akt2 and hexose transport is partially inhibited.

24. The method of claim 22, wherein the agent is a siRNA specifically targeted to Akt1, Akt2, or both.

25. The method of claim 24, wherein the siRNA targeting Akt2 targets a sequence of SEQ ID NO: 7 or SEQ ID NO: 8.
26. The method of claim 24, wherein the siRNA targeting Akt1 targets a sequence of SEQ ID NO: 5 or SEQ ID NO: 6.
27. A method of identifying a gene that affects glucose transport, the method comprising:
- (a) introducing into an adipocyte an siRNA targeted against the gene using the method of claim 1;
 - (b) culturing the cell under conditions suitable for expression of the targeted gene;
 - (c) assaying glucose transport in the cell, wherein a reduction in glucose transport indicates that the targeted gene affects glucose transport;
- thereby identifying a gene that affects glucose transport.
28. A method for identifying an insulin response modulator, comprising:
- (a) contacting a cell expressing a protein that affects glucose transport with a test compound, wherein the protein is encoded by a gene identified according to the method of claim 27, and
 - (b) determining the ability of the test compound to modulate an activity of the protein, such that the insulin response modulator is identified.
29. A method for identifying an insulin response modulator, comprising:
- (a) contacting a cell expressing a protein that affects glucose transport with a test compound, wherein the protein is encoded by a gene identified according to the method of claim 27, and
 - (b) determining the ability of the test compound to modulate expression of the protein, such that the insulin response modulator is identified.
30. The method of claim 28 or 29, wherein the modulator is a positive modulator.
31. The method of claim 28 or 29, wherein the modulator is a negative modulator.
32. A modulator identified by the method of claim 28 or 29.

33. A pharmaceutical composition comprising the modulator of claim 32.
34. A method of regulating glucose homeostasis in a subject comprising administering to the subject an insulin response modulator of claim 32.
35. A method of regulating blood glucose levels in a subject comprising administering to the subject an insulin response modulator of claim 32.
36. A method of treating an insulin response disease or disorder comprising administering the pharmaceutical composition of claim 33.
37. The method of claim 36, wherein the disease or disorder is selected from the group consisting of Type II diabetes, insulin resistance and obesity.